

What is claimed is:

1. A ferroelectric layer including space charges,
wherein the space charges show a concentration peak at least at one of an upper
5 portion and a lower portion of the ferroelectric layer in a direction of the thickness of
the ferroelectric layer.

2. The ferroelectric layer as defined in claim 1, wherein:
the space charges show a concentration peak at the upper portion and the lower
10 portion of the ferroelectric layer; and
the polarities of the space charges at the upper and lower portions are different
from each other.

3. A method of manufacturing a ferroelectric layer including space charges,
15 wherein the space charges are formed by causing a crystal defect to occur at
least at one of an upper portion and a lower portion of the ferroelectric layer in a
direction of the thickness of the ferroelectric layer.

4. The method of manufacturing a ferroelectric layer as defined in claim 3,
20 wherein:
the space charges are formed by causing a crystal defect to occur at the upper
portion and the lower portion of the ferroelectric layer; and
the polarities of the space charges at the upper and lower portions are different
from each other.

25 5. A method of manufacturing a ferroelectric layer, comprising:
forming a first ferroelectric section including space charges generated by

causing a crystal defect to occur; and

forming a second ferroelectric section over the first ferroelectric section.

6. The method of manufacturing a ferroelectric layer as defined in claim 5, further
5 comprising:

forming a third ferroelectric section including space charges generated by
causing a crystal defect to occur over the second ferroelectric section,

wherein the polarities of the space charges in the first ferroelectric section and
the third ferroelectric section are different from each other.

10

7. The method of manufacturing a ferroelectric layer as defined in claim 3,
wherein the crystal defect is caused by the absence of part of substances in the
stoichiometric composition of the ferroelectric layer.

15

8. The method of manufacturing a ferroelectric layer as defined in claim 3,
wherein the crystal defect is caused by crystallization heat treatment in which
oxygen partial pressure is controlled.

20

9. The method of manufacturing a ferroelectric layer as defined in claim 3,
wherein the crystal defect is caused by introducing impurities.

10. The method of manufacturing a ferroelectric layer as defined in claim 5,
wherein the crystal defect is caused by the absence of part of substances in the
stoichiometric composition of the ferroelectric layer.

25

11. The method of manufacturing a ferroelectric layer as defined in claim 5,
wherein the crystal defect is caused by crystallization heat treatment in which

oxygen partial pressure is controlled.

12. The method of manufacturing a ferroelectric layer as defined in claim 5,
wherein the crystal defect is caused by introducing impurities.

5

13. A ferroelectric capacitor comprising the ferroelectric layer as defined in claim 1.

14. A ferroelectric capacitor comprising the ferroelectric layer as defined in claim 2.

- 10 15. A ferroelectric memory comprising the ferroelectric capacitor as defined in
claim 13.

16. A ferroelectric memory comprising the ferroelectric capacitor as defined in
claim 14.

15

17. The ferroelectric memory as defined in claim 15,
wherein the ferroelectric memory is operated by nondestructive readout.

18. The ferroelectric memory as defined in claim 16,
20 wherein the ferroelectric memory is operated by nondestructive readout.